

Application No. 10/721,308
Amendment dated September 30, 2005
Reply to Office Action of June 30, 2005

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of controlling pressure in a fluid system having a source of pressurized fluid for which a maximum desired fluid pressure value has been determined, a hydraulic load, an apply valve controlling pressurized fluid flow between said source and said load, and a release valve permitting fluid flow from said load to a low pressure reservoir, comprising:

controlling pressure at said hydraulic load by at least one of closing the release valve and opening the apply valve to increase pressure at said hydraulic load, and by at least one of closing said apply valve and opening said release valve to reduce pressure at said hydraulic load; and

limiting pressure of said source of pressurized fluid by electrically opening both said apply valve and said release valve from the positions required to control pressure at said hydraulic load a sufficient amount to permit pressurized fluid from said source of pressurized fluid to flow through said apply valve and said release valve to said low pressure reservoir at a flow rate sufficient to limit pressure of said source of pressurized fluid to less than said maximum desired fluid pressure value.

2. (Cancelled)

3. (Currently Amended) A method for controlling the pressure in an electrohydraulic braking system having a pump, an accumulator and a valve arrangement controlling pressure at a vehicle brake, comprising the steps of:

sensing an accumulator pressure;

comparing the sensed accumulator pressure to a preset pressure set-point;

controlling at least one valve in the valve arrangement to allow fluid to flow through the valve if the sensed accumulator pressure at least equals the preset pressure set-point; and

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~~controlling an apply valve in the valve arrangement to allow excess fluid in the accumulator to flow out of the accumulator if the sensed accumulator pressure at least equals the preset pressure set-point.~~

determining that the pump is running while accumulator pressure is above a pump shut-off pressure; and

providing a signal to bias the at least one valve to rapidly open to a point in excess of that which would be demanded based on accumulator pressure alone in anticipation of further pressure rise due to the pump failing to shut off.

4. (Currently Amended) The method defined in Claim 3 18 further comprising the step:

controlling a release valve in the valve arrangement to allow excess fluid to flow into a reservoir if the sensed pressure at least equals the preset pressure set-point and a pressure at a vehicle brake is above a demanded pressure.

5. (Cancelled)

6. (Currently Amended) The method defined in Claim 5 4 further comprising the step:

acting in a first manner if the accumulator pressure at least equals the preset pressure set-point with the pump being off; and

acting in a second manner if the accumulator pressure at least equals the preset pressure set-point with the pump being on.

7. (Original) The method defined in Claim 6 wherein the first manner of acting comprises opening the apply and release valves a first amount of opening to allow flow therethrough;

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the second manner of acting comprises anticipatively opening the apply valves a second amount of opening, greater than said first amount of opening, to allow flow therethrough.

8. (Original) The method defined in Claim 6 wherein the first manner of acting comprises opening the apply and release valves a first amount of opening to allow flow therethrough; and

the second manner of acting comprises anticipatively opening additional apply and release valves to allow flow therethrough.

9. (Currently Amended) A method of controlling pressure in an electrohydraulic braking system having a source of pressurized fluid for which a maximum desired fluid pressure value has been determined, at least one hydraulically operated brake, an apply valve associated with the at least one brake for controlling pressurized fluid flow between the source and the at least one brake, and a release valve associated with the at least one brake for controlling fluid flow from the at least one brake to a low pressure reservoir, comprising:

controlling pressure at the at least one brake by at least one of closing the associated release valve and opening the associated apply valve to increase pressure at the at least one brake, closing the associated apply valve and opening the associated release valve to reduce pressure at the at least one brake, and closing both the associated apply valve and the associated release valve to hold pressure at the at least one brake; and

when sensed pressure of the source exceeds the maximum desired fluid pressure value, controlling pressure of the source of pressurized fluid by simultaneously electrically opening both the associated apply valve and the associated release valve from the positions required to control pressure at the at least one brake a sufficient amount to permit pressurized fluid from the source of pressurized fluid to

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flow through the associated apply valve and the associated release valve to the low pressure reservoir to lower pressure at the source of pressurized fluid below the maximum desired fluid pressure value.

10. (Original) The method of controlling pressure in an electrohydraulic braking system defined in Claim 9, further including controlling pressure of the source of pressurized fluid by simultaneously opening both a second apply valve and a second release valve from the positions required to control pressure at a respective second brake a sufficient amount to permit pressurized fluid from the source of pressurized fluid to flow through the second apply valve and the second release valve to the low pressure reservoir to lower pressure at the source of pressurized fluid while simultaneously continuing to control pressure at the respective second brake to a desired pressure.

11. (Original) The method of controlling pressure in an electrohydraulic braking system defined in Claim 9 wherein the operation of controlling pressure at the at least one brake is performed by a first electronic control unit, and the operation of controlling pressure of the source of pressurized fluid is controlled by a second electronic control unit.

12. (Original) The method of controlling pressure in an electrohydraulic braking system defined in Claim 9 wherein the operation of controlling pressure at the at least one brake and the operation of controlling pressure of the source of pressurized fluid is controlled by a single electronic control unit.

13. (Original) The method of controlling pressure in an electrohydraulic braking system defined in Claim 9 wherein the source of pressurized fluid includes a motor-driven pump, operation of at least one of the motor and the pump being sensed

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and provided as input to a controller controlling operation of the apply valve and the release valve.

14. (Original) The method of controlling pressure in an electrohydraulic braking system defined in Claim 13 wherein the input to the controller indicating operation at least one of the motor and the pump is an input to an anticipative function which biases the apply valve and the release valve toward a more open initial position than would be assumed based on solely the difference between a pressure of the fluid supplied by the source of pressurized fluid and a pressure relief set-point when operation of the at least one of the motor and the pump is sensed and the pressure of the fluid supplied by the source of pressurized fluid is above a desired pump shut-off set-point.

15. (Previously Presented) The method of controlling pressure in an electrohydraulic braking system defined in Claim 14 wherein the braking system includes a second apply valve and a second release valve operating at respective initial positions to control pressure at a respective second brake, the anticipative function additionally opening both the second apply valve and the second release valve toward respective positions more open than their respective initial positions point when the pressure of the fluid supplied by the source of pressurized fluid is above a pressure relief set-point and operation of the at least one of the motor and the pump is sensed and the pressure of the fluid supplied by the source of pressurized fluid is above the desired pump shut-off set-point.

16. (Original) The method of controlling pressure in an electrohydraulic braking system defined in Claim 15 wherein the anticipative function biases both the second apply valve and the second release valve toward respective positions more open than the positions that would be assumed based on solely the difference between

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the pressure of the fluid supplied by the source of pressurized fluid and the pressure relief set-point.

17. (Original) The method of controlling pressure in an electrohydraulic braking system defined in Claim 9 wherein the braking system includes a second apply valve and a second release valve operating at respective initial positions to control pressure at a respective second brake, the method further including controlling pressure of the source of pressurized fluid by additionally simultaneously opening both the second apply valve and the second release valve from the positions required to control pressure at the respective second brake a sufficient amount to permit additional pressurized fluid from the source of pressurized fluid to flow through the second apply valve and the second release valve to the low pressure reservoir to lower pressure at the source of pressurized fluid.

18. (New) The method defined in Claim 3 further comprising the step:
controlling an apply valve in the valve arrangement to allow excess fluid in the accumulator to flow out of the accumulator if the sensed accumulator pressure at least equals the preset pressure set-point.